causes increased mechanical stress that has been associated with altered bony morphology. There have been no clinical studies assessing the characteristics of the biceps tendon in relation to humeral torsion in professional baseball pitchers. This study was used to examine humeral torsion in those pitchers presenting with abnormal versus normal biceps tendons.

Methods: A bilateral ultrasound examination was performed on 30 pitchers from one professional baseball club. The biceps was characterized as normal if the biceps appearance was hyperechoic and uniform thickness. It was abnormal if the biceps was subluxed or dislocated from the groove, the tendon was thickening with abnormal echo texture, the tendon presented with a halo sign or demonstrating fluid distension around the sheath. The reliability for humeral torsion measures was acceptable with ICC's =.99 and SEM=1.3. The inter rater reliability for characterization of the biceps tendon was Kappa =.89. A one-way ANOVA was performed to determine the difference in humeral torsion between those with abnormal versus normal biceps tendons.

Results: Eighty percent of the dominant biceps tendons were characterized as abnormal. The dominant shoulders with abnormal biceps tendons had a significantly more antetorsion on the dominant side than those presenting with normal biceps. (15.1±9.7 vs. 5.4±11.1;P= 0. 05).

Conclusion: Eighty percent of the dominant shoulders in professional baseball pitchers had abnormal biceps. Professional pitchers with abnormal biceps also displayed less humeral retrotorsion compared to pitchers with normal biceps. Recently we have shown that pitchers with less humeral retrotorsion are more at risk for shoulder pain. The lack of humeral retrotorsion and associated pathological imaging of the biceps may represent subclinical findings in these pitchers. Our results suggest future studies should examine the influence of humeral torsion and biceps abnormalities in professional pitchers.

Effectiveness of a Preseason Prevention Program on Arm Injury Risk Factors: An Randomized Control Trial in Adolescent Pitchers

SS-28

April 15, 10:05 AM

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Introduction: Deficits in posterior shoulder flexibility and strength have been identified as risk factors for pitching injuries. This study assessed the effectiveness of a preseason prevention program to resolve these deficits in adolescent pitchers.

Methods: Pitchers(n=143 age=15.7±1.2;height=165.0± 43.8cm; weight=72.2±12.6kg) participating in team activities were block randomized by school to intervention(INV n=88) or control(CON n=76). INV received an ATC supervised program(3x/week for 8-weeks). The CON had their usual training. All pitchers participated in a 4-week interval-throwing program immediate to the start of practice. Pre-post supine bilateral ER, IR, and HA ROM and strength were assessed using a digital inclinometer with the scapula stabilized at 90° of abduction. Muscle testing was used for strength assessments via held dynamometer with arm at the side and in supine 90°/90° then normalized to body weight(BW). Injuries were recorded over the subsequent baseball season. Two trials were averaged to calculate deficits(non-dominant−dominant) and pre-post change to determine if the program to ameliorate baseline deficits. A one-way ANOVA compared change scores between groups and a 2-way ANOVA(group by injury) compared change scores influence on injury(α=0.05).

Results: The INV group displayed a greater reduction in IR deficit(INV=7.3°±11;CON=1.8°±9;F(1,106)=5.1,P=0.01) P=0.05) and HA deficit(INV=3.3°±13; CON= -2.4°± 11;F(1,106)=6.7,P=0.01) compared to the CON group. The INV group also maintained their dominant ER-0:IR-90 ratio(INT=-1.6 ±5%BW;CON= -3.5 ±5%BW; F(1,106)= 2.1,P=0.09) compared to the CON group. There were 19 arm injuries over the subsequent season(INV=11 ;CON=8 arm injuries). Control group pitchers with an injury did not decrease their HA deficit (Uninjured=3.0°± 10;Injured=-9.5°±14;F(1,106)=3.3,P=0.03) or their IR deficit went on to suffer an injury(Uninjured=-1.7°±8;Injured 8.5°±13;F(1,106)=3.8,P=0.02). There were no other differences between or among groups(P>0.05).

Conclusion: Adolescent pitchers displayed clinically meaningful improvements in posterior shoulder flexibility (HA and IR) and maintenance of their ER:IR ratio during an Athletic Trainer supervised preseason program. The improvements were associated with decreased injury risk over the course of the subsequent season.

Post-operative Alpha Angle Not Associated with Outcomes 5 Years following Hip Arthroscopy for FAI

SS-29

April 15, 1:30 PM

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Introduction: The alpha angle is currently the most used parameter for defining cam type femoroacetabular impingement(FAI). The purpose of this study was to determine if post-operative alpha angle is a predictor of patient outcomes 5 years following hip arthroscopy for FAI. Our hypothesis was that post-operative alpha angle(AA) would not influence clinical outcomes in patients with FAI.

Methods: 230 patients had primary hip arthroscopy for FAI. Average age was 38(range 18 to 69). All patients had preoperative and post-operative alpha angles recorded. At 5 years following arthroscopy, all patients completed